



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,908	09/30/2003	Evon Llewellyn Crooks	030627/267420	9006

826 7590 10/31/2007
ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER

LAZORCIK, JASON L

ART UNIT	PAPER NUMBER
----------	--------------

1791

MAIL DATE	DELIVERY MODE
-----------	---------------

10/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MAILED
OCT 31 2007
GROUP 1700

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/674,908
Filing Date: September 30, 2003
Appellant(s): CROOKS ET AL.

Mr. Christopher M. Humphrey (Reg. No. 43,683)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 25, 2007 appealing from the Office action mailed October 4, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,629,525	COUNTS	12-1997
6,814,786	ZHUANG	11-2004
2004/0226569	YANG	11-2004

Henning, K.D., Degel, J. "Purification of air, water and off gas-solvent recovery", March 1990, reference printed May 25, 2006 from "<http://www.activated-carbon.com/solrec2.html>"

Keith, C.H., "Tobacco Smoke filtration" 1970 (est.) Bates:2501260096-2501260130., reference printed September 26, 2006 from (<http://tpbaccpdpci.emts/prg/pm/2501260096-0130.html>)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

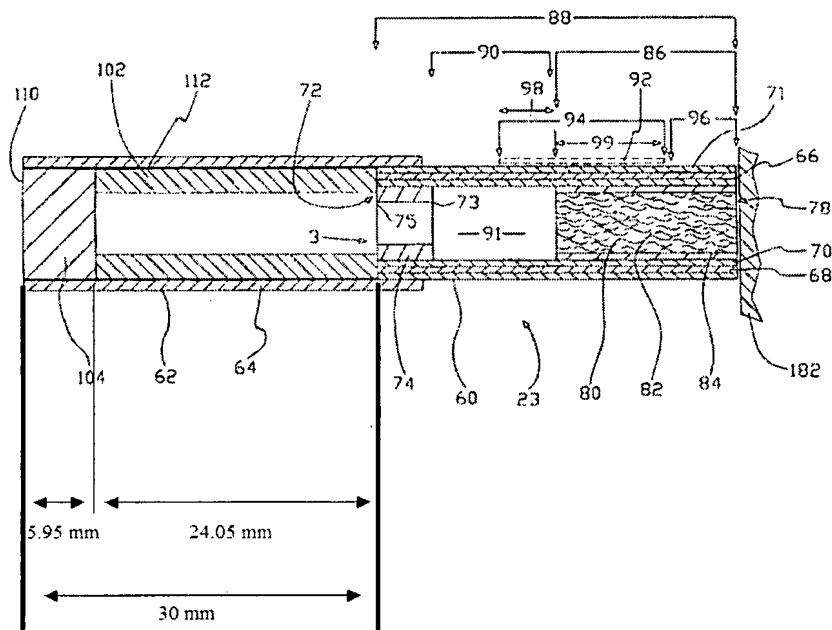
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims **1, 3-15, and 17-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Counts (5,629,525) in view of Zhuang (US 6,814,786 B1) and Yang (US 2004/0226569 A1) and in further view of Keith et. al. (<http://tobaccodocuments.org/pm/2501260096-0130.html>).

Counts teaches (see annotated figure below) a multi-segment filter comprising a mouthpiece filter plug (**104**), tubular free flow filter element (**102**), and tubular free flow filter (**72**). Counts continues by disclosing several dimensions including (Column 8, Lines 38-40) that the combined length of the mouthpiece filter (**104**) and free-flow filter

Art Unit: 1762

(102) is preferably 30mm and that the tipping paper (62) extends approximately 6 mm over the tobacco rod (60). It is therefore obvious from the immediate reference Figure 4a that the filter elements (104) and (102) have length dimensions of approximately 6mm and approximately 24mm, respectively. Further, since the tubular free flow filter (72) is longer than the portion of the tipping paper which extends over the tobacco rod, the length of said filter is at least 6mm but less than 12mm as evidenced from the figure.



While Counts does not disclose the incorporation of an absorbent or hollow section, both Zhuang and Yang disclose modifications with specific reference to the Counts multi-segment filter structure described above.

Zhuang teaches a filter for incorporation into a smoking article which includes at least two monolithic sorbent segments and a mixing segment disposed between the sorbent segments. The following excerpt Figure 1 from the immediate reference depicts a filter (30) comprising sorbent segments (32) and a hollow mixing region (37) defined

Art Unit: 1762

by the sorbent segments. Zhuang further teaches (Column 7, Lines 4-6) that the length of the sorbent segments L is preferably less than about 5mm and more preferably from about 0.5mm to about 2mm.

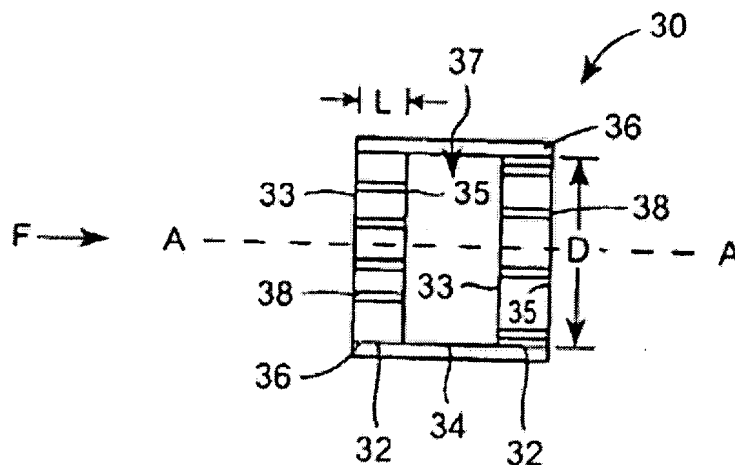


FIG. 1

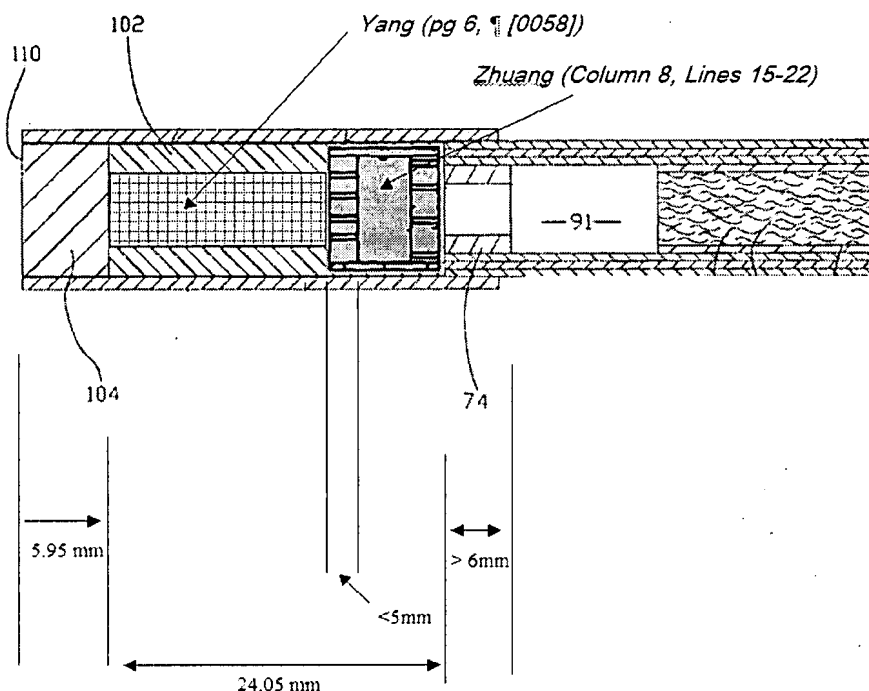
Referring specifically to the Counts multi-segment filter (see immediate reference figure 15), Zhuang teaches (Column 14, Lines 16-21) that the "filter (30) can be...substituted **as part of**, or in place of the tubular free-flow filter element (102)." Zhuang teaches (Column 4, Lines 1-3) the mixing region (37) of filter (30) promotes the mixing of gas that has passed through one monolithic sorbent segment before entering an adjacent sorbent segment. Further, this mixing region can increase gas recombination to enhance the filtration selectivity.

Yang teaches the preparation of a flavored carbon useful as a filtering material in a cigarette in order to impart desired taste while removing one or more components from mainstream smoke. Specifically, the activated carbon comprises granulated carbon (pg3, ¶ [0031]) having particles in ranging in size from about 6 mesh to about 70

Art Unit: 1762

mesh. Again with specific reference to the Count multi-segment filter, Yang teaches (Pg 6, ¶ [0058]) that the flavored carbon particles can be incorporated in various ways such as by being loaded onto paper or other substrate material which is *fitted into the passageway of the tubular free-flow filter element (102).*"

The composite structure displaying the Counts filter modified as taught by Zhuang and Yang is presented below and is hereafter referred to as the Modified Counts Filter hereinafter abbreviated as "MCF". The Zhuang filter (30) has been superimposed over a portion of the tubular filter element (102) to graphically exemplify its substitution as a part of the tubular filter element in accordance with the Zhuang teachings (Column 14, Lines 16-21). In light of the prior art as presented above, it would have been obvious to one of ordinary skill in the art *to substitute a portion of the free flow filter element (102) with filter (30)* as taught by Zhuang in order to increase the filtering selectivity of the multi-segment filter. Further, it would have been obvious to one of ordinary skill in the art to additionally modify the Counts filter by *filling the remaining portion of the free-flow filter element (102) with flavored activated carbon particles* as taught by Yang in order to selectively remove one or more components from and add flavor to the mainstream smoke.

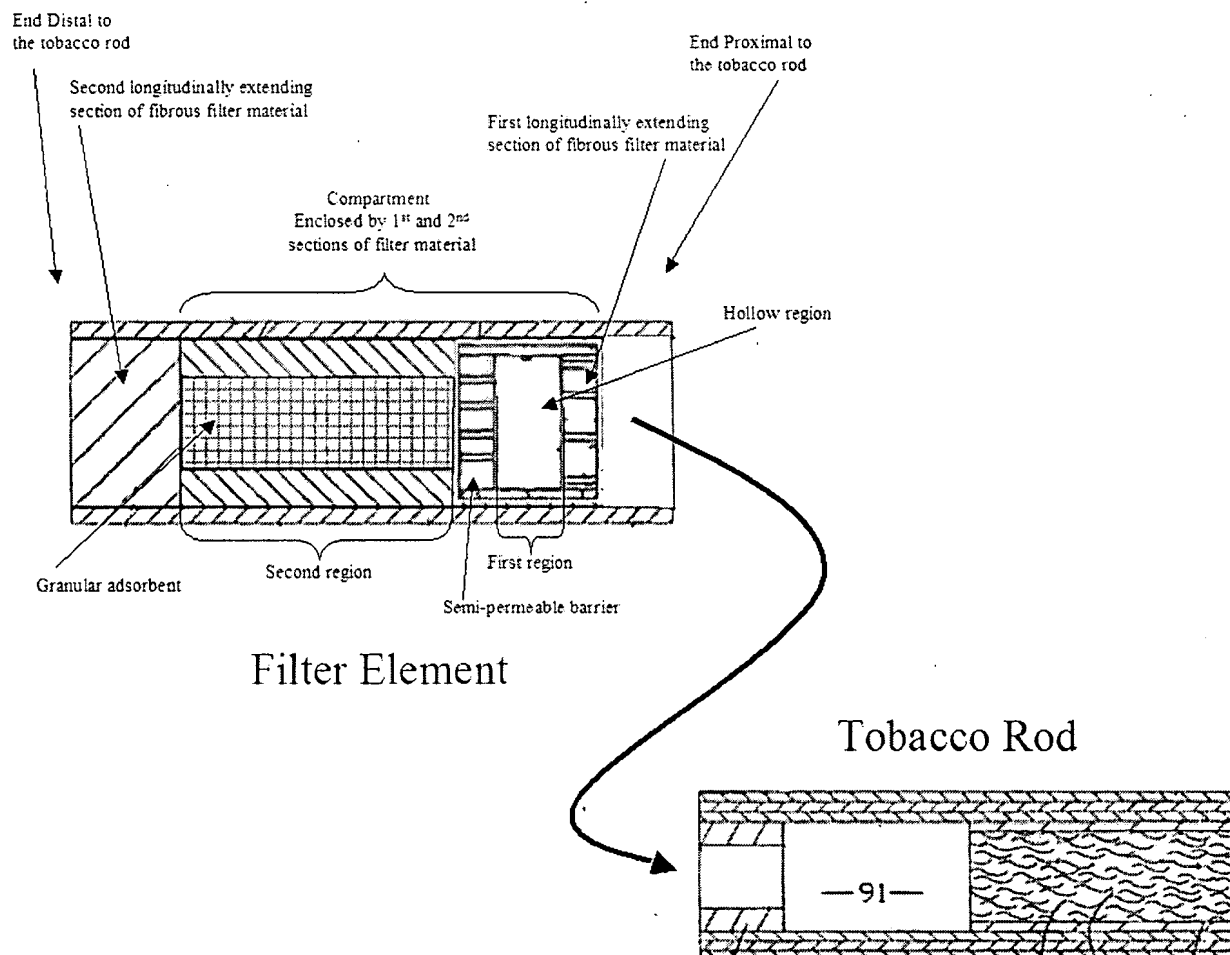


In order to facilitate the examination of the immediate claims, the above cigarette depicted comprising the MCF or "a filter element" has been displayed below as separate or disconnected from the tobacco rod.

Regarding Claims 1 and 20, the MCF comprises a first longitudinally extending section of filter material (Sub-element (32) of filter (30) proximal to the tobacco rod) positioned at the end of the filter element proximal to the tobacco rod and a second longitudinally extending section of filter material (Counts mouthpiece filter plug (104)) positioned at the end of the filter element distal from the tobacco rod. The latter filter element is spaced apart from the first section of filter material and the two sections of filter material define a compartment there between. It is evident from the image below that each section of filter material encloses its respective end of the compartment, or as

Art Unit: 1762

the applicant argues, it "extends across the entire cross-sectional area of a compartment formed in a cigarette filter". A semi-permeable barrier (Sub-element (32) of filter (30) proximal to the mouth piece) of filter material divides the compartment into a first region adjacent to the first section of filter material and a second region adjacent to the second section of filter material. In accord with the teachings of Yang, an adsorbent material or granular adsorbent material is contained within the second region of the compartment while the first region defined by the volume between the first longitudinally extending section of filter material and the semi-permeable barrier (Sub-elements (32) of filter (30)) remains hollow.



Neither Counts nor Zhuang explicitly teach that a "fibrous tow" material is used as the material of construction for the first or second longitudinally extending section of fibrous material as set forth in Claims 1 and 20. However, Zhuang does indicate that the filter element (30) comprises a sorbent which includes at least two sorbent segments, and at least one mixing region between two adjacent sorbent segments. The sorbent can be chosen from various porous materials that are capable of removing gas-phase constituents from gas flows. In a preferred embodiment the sorbent comprises activated carbon. " (Column 3, Lines 55-64)

To this end, Keith et. al. teaches generally that "a filter is essentially a subtractive device" (pg1, ¶2) and that "the removal of vapors by chemical and physical sorption on the filtering material is also an important component of the filtration process" (Pg1, ¶4). Keith continues by asserting that "...most current filters are made from one or more of three materials, these being cellulose acetate fibers, cellulose fibers and granular activated carbon. Of these materials, cellulose acetate in the form of a tow or bundle of continuous filaments is by far the most common filtering agent. In this country, 91% of all cigarette filters produced were of the acetate type, 5% were of dual construction with an acetate tow segment combined with a cellulose, carbon, or mouthpiece segment, 3% were of tow or three unit construction utilizing acetate and carbon alone or in combination in the various segments, and 1% contained cellulose or cellulose plus carbon as components" (Pg2, ¶2)

Given the widespread utilization of cellular acetate tow and activated carbon as constituents in cigarette filters, it would have been obvious to one of ordinary skill in the

Art Unit: 1762

art at the time of the invention to modify the MCF filter to utilize these materials of construction. Specifically, since fibrous tow is by far the most common filtering agent, it would have been obvious to fabricate either of the longitudinally extending sections of fibrous material or the semi-permeable barrier out of cellulose acetate tow or "a fibrous tow material" either alone or in combination with granular activated carbon.

Claim 3 is rendered obvious in light of the rejection of Claim 1 under 35 USC 103(a) and wherein the cellulose acetate tow material described in the Keith et. al. reference is held to be functionally equivalent to the claimed plasticized cellulose acetate tow material.

With reference to the annotated dimensions in the MCF figure above, Claims 4 through 13 are rendered obvious.

Specifically regarding Claim 4, the overall length of the filter element MCF [(104), (102), (30), and (74)] is approximately 36mm which is intermediate between the claimed overall filter length of about 15 mm and about 65mm.

Regarding Claim 5, the overall length of the filter element MCF [(104), (102), (30), and (74)] is approximately 36mm which is intermediate between the claimed overall filter length of about 15 mm and about 50 mm.

Regarding Claim 6, the length of the second (104) and first (72) sections of filter material is approximately 6mm and approximately 6 to 12mm, respectively, which is intermediate between the claimed length of said sections of about 5 mm and about 25 mm.

Similarly with respect to Claim 7, the length of the second **(104)** and first **(72)** sections of filter material is approximately 6mm and approximately 6 to 12mm, respectively, which is intermediate between the claimed length of said sections of about 5 mm and about 15 mm.

Regarding Claims 8 and 9, it is well known that pressure drop increases along a backed bead in accord with increasing bed length. It would be obvious to one of ordinary skill in the art to optimize the length of the adsorbent-containing region **(102)** in order to optimize the resulting pressure drop during a draw in order to provide the desired resistance to draw.

Regarding Claim 10, the length of the compartment defined by **(102)** and **(30)** is approximately 24 mm which is intermediate between the claimed compartment length of about 10 mm and about 50 mm.

Similarly regarding Claim 11, the length of the compartment defined by **(102)** and **(30)** is approximately 24 mm which is intermediate between the claimed compartment length of about 10 mm and about 30 mm.

With respect to Claim 12, the length of the semi-permeable barrier defined by length L above is given as preferably less than about 5mm and more preferably from about 0.5mm to about 2 mm which reads directly on the claimed barrier length of between about 1 mm and about 10 mm.

Regarding Claim 13, the length of the semi-permeable barrier defined by length L above is given as preferably less than about 5mm and more preferably from about

Art Unit: 1762

0.5mm to about 2 mm which reads directly on the claimed barrier length of between about 1 mm and about 5 mm.

Regarding claim 14, the chamber **(102)** of the MCF incorporates granulated, activated carbon with a particle size in the range 6 to 70 mesh of which obviously reads on the present claim as selecting one adsorbent from among the cited acceptable group of adsorbents which includes activated carbon.

Claim 15 is clearly anticipated in light of the Claim 14 rejection laid forth above where the adsorbent is activated carbon.

Claim 17 is clearly anticipated in light of the Claim 14 rejection laid forth above where the adsorbent is granular in form.

Claim 18 is clearly anticipated in light of the Claim 14 rejection laid forth above where the adsorbent has a particle size in the range of about 8x16 mesh to about 30x70 mesh.

Claim 19 is rejected as obvious in light of the rejection of Claim 1 under 35 USC 103(a).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Counts (5,629,525) in view of Zhuang (US 6,814,786 B1) and Yang (US 2004/0226569 A1) and Keith et. al. as applied to the rejection of claim 15 above and in further view of Degel 1990.

Yang teaches that the activated carbon utilized in the disclosed invention preferably has a specific surface area of "at least 100m²/g, preferably at least 250 m²/g

Art Unit: 1762

and more preferably at least 500 m²/g, e.g. 1000 to 2000 m²/g" (Pg 2, ¶[0028]. Yang does not teach that the activated carbon has an activity of about 60 to about 150 Carbon Tetrachloride Activity. Degel however asserts that the pore volume distribution (and therefore specific surface area) is an important variable that affects carbon performance. Further, Degel (see table) displays a clear positive relationship between the surface area of activated carbon and the Carbon Tetrachloride Activity of said activated carbon. It would have been obvious to one of ordinary skill in the art to optimize the surface area and thus the Carbon Tetrachloride Activity of the activated carbon incorporated in a cigarette filter to optimize the filtering performance of said filter.

(10) Response to Argument

Argument #1(a,b,c) – regarding the rejection of Claims 1, 3-15, and 17-20 under 35 U.S.C. §103(a) over Counts '525 in view of Zhuang '786, Yang '569, and Keith et. al.

Argument 1-A): Lack of motivation to combine Counts, Zhuang, and Yang references to form the claimed filter configuration

Applicant first argues (page 4, lines 14-15) that a teaching or suggestion to combine references and evidence of a reasonable expectation of success to be derived

Art Unit: 1762

through said combination “must both be found in the prior art and not based upon applicant’s disclosure”. The Examiner disagrees.

In response to the instant argument, Applicant is advised that the recent KSR decision forecloses the argument that a specific teaching, suggestion or motivation within the references is required to support a finding of obviousness, see the recent Board decision *Ex parte Smith*, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007).

Applicant next acknowledges that both Zhuang and Yang explicitly disclose specific modifications to the Counts filter structure, however Applicant asserts that there is nothing to suggest the specific arrangement of elements as claimed in the application. Applicant specifically alleges that the Zhuang filter element could be substituted for any portion of the Counts filter, and that “there is no suggestion as to the specific arrangement of the Zhuang filter component in relation to activated carbon particles from the Yang reference”. Applicant further asserts that the prior art teachings “provide absolutely no guidance or suggestion as to how the filter elements described therein could be incorporated into the Counts filter relative to one another”. Applicant therefore concludes that collectively the references set forth an unacceptably large number of potential filter arrangements with no motivation to select one over another.

The Examiner first disagrees with Applicants allegation that the prior art teach an inordinate number of combinations for one of ordinary skill in the art to arrive at the claimed structure. The Examiner additionally disagrees with Applicants assertion that

Art Unit: 1762

one of ordinary skill in the art who was aware of the Counts, Zhuang, and Yang references would find no motivation to combine sub-elements to derive at the claimed filter structure.

1) With respect to the number of potential filter structures presented by the combined prior art references, it may prove instructive to examine the number of potential combinations explicitly disclosed by each prior art reference in order to gauge the total number of potential combinations.

Specifically, Zhuang (Column 14, lines 15-21) teaches that the filter element (30) may be substituted in place of the tubular free-flow filter element (102) or in place of the free-flow filter element (74) which provides two potential configurations. The reference further teaches that element (30) could be substituted as a part of either element (102) or element (74) or within the void space (91). In each of these permutations, it may be argued that element (30) could be substituted for a sub-portion of the respective element in a position a) at an end proximal to the tobacco column, b) at an end proximal to the mouth-piece, or c) at an intermediate position between the respective ends. It follows that Zhuang explicitly posits roughly 11 filter configurations, namely 2 from complete substitution of (102) or (74) and 3 each for the partial substitution of element (102) or (74) or the placement of (30) in void (91).

After disclosing this relatively modest number of discrete, preferred embodiments, Zhuang in essence states that one of ordinary skill in the art would be able to derive further embodiments from the disclosure. Specifically, Zhuang indicates

Art Unit: 1762

that “the filter portion 62 can be modified to create one or more void spaces into which filter 30 can be located”. Applicant construes the latter statement as an indication that the Zhuang teaches “every single sub-component as a possible location”, that Zhuang does not motivate one of ordinary skill in the art to place the filter (30) at any particular location, and that the prior art teaches only “a broad suggestion that component 30 can be somehow incorporated into the Counts filter”. The Examiner finds this allegation to be a clear misrepresentation of the Zhuang teachings. In view of the foregoing discussion, it is the Examiner’s position that Zhuang does in fact provide unambiguous direction as to placement of element (30) and that Zhuang provides a modest number of potential preferred embodiments .

Next, the Yang reference explicitly teaches in paragraphs ¶¶ 0058 to ¶¶ 0060 that the flavored carbon particles can be incorporated a) in the passageway of free-flow filter (102), b) in the wall portion of free-flow filter (102), c) into the mouth piece filter plug (104). As with the Zhuang reference, Yang next effectively states that one of ordinary skill in the art would be able to derive further embodiments in view of the disclosure. Specifically, Yang states that “the filter portion of 62 of Fig. 10 can also be modified to create a void space into which the flavored carbon particles can be inserted”. It follows from the foregoing that Yang teaches 3 explicit, preferred embodiments and provides a broad statement that the explicit embodiments should not be construed as limiting embodiments to one of ordinary skill in the art.

Now, crossing the eleven explicit embodiments of the Zhuang disclosure with the three explicit embodiments in the Yang reference provides approximately 33 potential combinations arising from the combined prior art teachings. It follows from the instant arguments that the combined prior art of Zhuang and Yang teach tens of potential filter structures, not hundreds and certainly not an infinite or unreasonable number of potential structures. Applicant may argue additional permutations not here covered, but even this line of argument would not appreciably alter the fundamental conclusion that the prior art teaches a reasonable number of filter structures to one of ordinary skill in the art. Therefore, the Examiner is not persuaded by Applicants argument that one of ordinary skill in the would find an unmanageable number of structural combinations arising from the combined prior art of record or that impermissible hindsight is required to derive at Applicants claimed filter structure.

2) With respect to Applicants allegation that one of ordinary skill in the art would find no motivation to select the particular filter arrangement and that the specific filter structure provides unexpected results, the Examiner is not persuaded. Specifically, Applicant broadly argues that the particular claimed arrangement of providing a hollow compartment upstream of an adsorbent region provides unexpected performance benefits in filter performance (page 8, second paragraph).

As stated in the previous Office Action dated October 4, 2006 and as restated in the grounds of rejection above, Zhuang teaches that the filter element (30) may be substituted into the Counts filter as a means to enhance the filtering selectivity of the

Art Unit: 1762

multi-segment filter. Specifically, Zhuang teaches (Column 4, Lines 1-3) that the mixing region (37) of filter (30) promotes the mixing of gas that has passed through one monolithic sorbent segment before entering an adjacent (e.g. downstream) sorbent segment. Further, this mixing region can increase gas recombination to enhance the filtration selectivity. Yang teaches that the flavored, activated carbon particles may be used to selectively remove one or more components from and add flavor to the mainstream smoke.

In view of the collective prior art teachings, it would have been a merely obvious alternative to one of ordinary skill in the art to place the Zhuang mixing region upstream of the Yang sorbent segment as a means to enhance the selective removal of gas phase components by the Yang sorbent. Specifically, Yang teaches a selective sorbent material and the Zhuang filter element is explicitly taught to enhance the filtration selectivity of "adjacent" sorbent segments located downstream filter element (30). It follows that the claimed interrelation of the Yang and Zhuang filter elements would have been recognized as a merely obvious extension over the collective prior art teachings.

Argument 1-B): Lack of motivation to combine the Keith reference with the Zhuang reference

Applicant argues that one of ordinary skill in the art would not have been motivated to further modify the Zhuang filter component by replacing element 32 with a common fibrous tow. At the outset, Applicant acknowledges that fibrous tow is widely

Art Unit: 1762

recognized as a conventional material for constructing filtration elements in the cigarette arts. Applicant however argues that the Zhuang reference teaches away from the incorporation of conventional fibrous tow into the filter element (30) structure.

Specifically, Applicant argues that 1) Zhuang teaches that common filter materials are “not advantageous”, 2) the preferred materials used by Zhuang do not suggest the use of common filter materials, and 3) that although Zhuang points to the use of conventional materials, the reference makes no suggestion that conventional filter materials would be suitable for use in element (30).

The Examiner is not persuaded.

The Keith reference (see page 9) teaches that it is widely known to use “cellulose or cellulose plus carbon as components” in the construction of cigarette filters. Zhuang (Column 4, lines 20-22) teaches that the sorbent segments of filter element (30) can comprise activated carbon and one or more molecular sieves. It is evident from the Keith disclosure that one of ordinary skill would find motivation to combine activated carbon with common fibrous tow in filter elements as directed by the reference. Further, Zhuang teaches that the filter element should comprise activated carbon, but it in no manner excludes the presence of conventional materials in the construction of filter element (30). It follows from the foregoing that one of ordinary skill would in fact find motivation to combine the prior art teachings of Keith and Zhuang as set forth above. It is the Examiners position that Applicant has misconstrued the scope of the Zhuang disclosure, and the arguments on this matter are therefore deemed to be unpersuasive.

Argument 1-C): Evidence of surprising results

Applicant argues that the particular arrangement claimed by Applicant provides substantially unexpected performance results. The Examiner disagrees that the particular arrangement provides unexpected results. As discussed above, the combined prior art teachings lay out approximately 33 potential filter structures several of which would provide for incorporation of the Zhuang filter element (30) upstream of the Yang adsorbent material. It is the Examiners position that placing the Zhuang mixing region upstream of the Yang sorbent segment would have represented a merely obvious approach to enhancing the selective removal of gas phase components by the Yang sorbent. While the structural arrangement of the filter may very well provide enhanced performance over other arrangements (e.g. element (30) downstream of the Yang adsorbent), the derived performance could hardly be considered "unexpected" in view of the collective prior art teachings.

Argument #2 – regarding the rejection of Claims 16 under 35 U.S.C. §103(a) over Counts '525 in view of Zhuang '786, Yang '569, Keith et. al., and the Degel 1990 reference.

Applicants arguments regarding the instant rejection have been fully addressed in the response to Argument #1 above.

Art Unit: 1762

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Jason L. Lazorcik

Conferees:


Steven P. Griffin


STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

/Jennifer Michener/

Quality Assurance Specialist, TC1700

Jennifer Michener